Catalogue of American Amphibians and Reptiles.

LAIS, P. MIKE 1976. *Gerrhonotus coeruleus.*

Gerrhonotus coeruleus Wiegmann
Northern alligator lizard

Gerrhonotus coeruleus Wiegmann, 1828:380. Type-locality, "Brasilien," in error, revised to San Francisco (San Francisco County), California by Stejneger (1902). Holotype, adult, Zoologisches Museum Berlin 1163, collected by A. von Chamisso in 1816 (holotype examined by author).
Gerrhonotus caeruleus: Boulenger, 1885:595 (part).

• CONTENT. Four subspecies are recognized: *coeruleus, palmeri, principis,* and *shastensis.*

• DEFINITION. A small species of *Gerrhonotus* (maximum snout-vent length about 135 mm., tail length about twice snout-vent length), with dorsal scales in fourteen to sixteen longitudinal rows and the interoccipital plate often divided (once or twice). Dorsal scales on body and tail and lateral scales of the tail are heavily keeled. The gray, brown, or olive body may be unicolor, but more frequently is marked with dark blotches or irregular dark bands, often with white-tipped scales on the sides. The eyes are yellow, with varying amounts of dark pigment near the pupil. The venter is cream, white, or light gray, and often has longitudinal dark stripes aligned between scale rows. Young have a broad, bronze to gray or tan, longitudinal dorsal stripe.

• DESCRIPTIONS. The original description by Wiegmann (1828) is detailed, but was based on a single specimen. The most thorough descriptions are by Fitch (1938), and Smith (1946). General descriptions are in Bocourt (1878), Van Denburgh (1897, 1922), Gregson (1934), Ditmars (1936), and Stebbins (1954, 1966). Minor descriptive notes are by Gray (1831, 1838, 1845), Baird and Girard (1852), Girard (1858), O'Shaughnessy (1873), Boulenger (1885), Stejneger (1893), Van Denburgh (1898), Cope (1900), Fitch (1934), and Woodbury (1945). The karyotype ($2n = 48$) was described by Bury, et al. (1969).

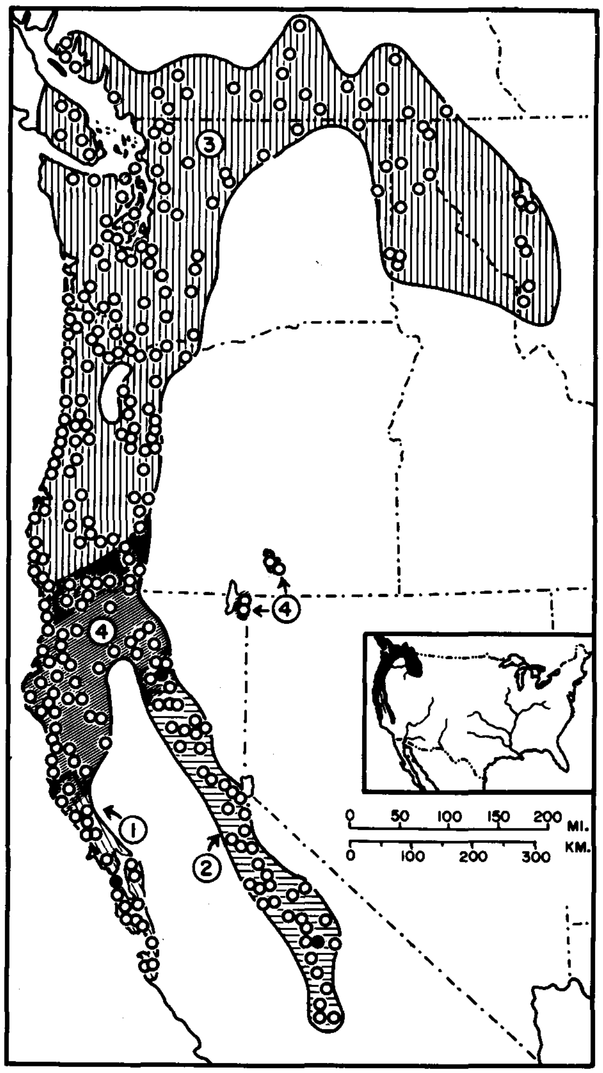
• ILLUSTRATIONS. Smith (1946) has black and white photographs of adults of all four subspecies of *G. coeruleus.* Black and white photographs of adults are in Van Denburgh (1922), Gordon (1939), Woodbury (1945), and Leviton (1972); and of adults and young in Gregson (1934), Fitch (1935), and Lewis (1946). Drawings of adult and juvenile are in Stebbins (1954); and of adults in Girard (1858), Van Denburgh (1897), and Carl (1944). Line drawings of head scutellation are in Bocourt (1878), Cope (1900), and Stebbins (1958). A color drawing of an adult is in Stebbins (1966), and a color photograph in Vitt (1971). McDowell and Bogert (1954) and Tihen (1949) illustrated the skull, and Frazetta (1962) gave a linkage diagram of the skull. Gomes (1974) illustrated trigeminal musculature. Gregson (1934) illustrated caudal anatomy.

• DISTRIBUTION. *Gerrhonotus coeruleus* ranges northward to British Columbia, and east into northern Idaho and northwestern Montana. In the west it extends southward along, and west of, the Cascade Range through Washington and Oregon, into California. In California it is found south along the coast to the Little Sur River, Monterey County, and in the Sierra Nevada past Sequoia National Forest, Kern County. In British Columbia it occurs on the islands of Coal, Cortez, Keats, Newcastle, Passage, Read, and Vancouver; in Washington on the islands of Anderson, Bainbridge, Camano, Fidalgo, Fox, Lummi, Orcas, Shaw, Vashon, and Whidby, including most of the San Juans; and in California on the islands of Angel, Brooks, and Yerba Buena in San Francisco Bay and on Año Nuevo Island, between San Francisco and Santa Cruz. Isolated populations of the subspecies *shastensis* occur in the Warner Mountains, Modoc County, California, and at Hart Mountain Antelope Refuge, Lake County, Oregon.

Gerrhonotus coeruleus occurs mainly in the Transition life zone, but is also found in the Upper Sonoran and Canadian zones, from sea level to above 7,500 feet. It prefers humid climates, where it is most often found in grassy grown-over areas at the margins of woodlands, in clearcuts, and sometimes near streams. Along the coast it may be found in open grassy areas far from trees or major cover. In some parts of the range it is found associated with rocky outcroppings and talus slopes. This species thrives in disturbed areas, such as old logging mills and clearcuts, where there is an abundance of surface debris. Photographs of *G. coeruleus* habitat are in Gregson (1934), Fitch (1935), and Vitt (1971).

• FOSSIL RECORD. None.

• PERTINENT LITERATURE. The best systematic account is by Fitch (1938); others are Tihen (1949), Stebbins (1958), and Waddick (1963). Natural history and feeding habits were described by Gregson (1934), Fitch (1935), Ditmars (1936), Stebbins (1954), Pope (1956), Schmidt and Inger (1957), and Leviton (1972). Feeding and cranial kinesis were considered by Frazetta (1962). Zavattari (1910) and Gomes (1974) described the jaw musculature. Mating behavior was reported by Vestal (1940), and Svihla (1942), and mating and young by Lewis (1946). Reproductive notes are in Greer (1967), Fitch (1970), and Vitt (1974b), and further details of reproductive biology in Vitt (1971, 1973). Positive embryo-maternal size correlation was discussed by Pimentel (1959), and induction of oviposition with oxytocin by La Pointe (1964). Notes on thyroid morphology are in Lynn and Colorigh (1967), and on the adrenal in Hebard



MAP. Hollow symbols represent known localities, several of which may share the same symbol. Solid symbols represent type-localities.

and Charipper (1955a, 1955b), Gabe, et al. (1964), and Gabe (1970). Notes on the cerebellum are in Larsell (1926), and on ear anatomy in Baird (1970). Gregson (1934) published a micro-anatomical study of tail regeneration. Criley (1968) considered *G. coeruleus* in a study of cranial osteology of gerrhonotines. Meszoely (1970) compared *G. coeruleus* to fossil anguids. Notes on body temperature are in Brattstrom (1955), and Vitt (1974a), and on hemoglobins in Dessauer, et al. (1957), and Guttman (1971). Gregson (1934) recorded *G. coeruleus* as a host for ticks. Peabody and Savage (1958) placed *G. coeruleus* in a phylogenetic line that moved southward through the Pacific Coast Range Corridor. Various distributional notes include Stejneger and Barbour (1917), Gregson (1934), Slevin (1934), Fitch (1936), Brown and Slater (1939), Slipp (1940), Brown (1948), Brunson and Demaree (1951), Schmidt (1953), Brunson (1956), Anderson (1960), Logier and Toner (1961), Slater (1963), Banta (1965), Banta and Morafka (1966), Storm (1966), Bury (1970), and Vitt (1971).

• ETYMOLOGY. The name *coeruleus* (Latin, blue) refers to the dorsal color of the type-specimen, described as *"supra coeruleus"*; *palmeri* honors T. S. Palmer, collector of the type-specimen; the meaning of *principis* (Latin, first place or chief) as used by Baird and Girard (1852) is unclear; *shastensis* refers to Shasta County, place of origin of the type-specimen.

1. *Gerrhonotus coeruleus coeruleus* Wiegmann San Francisco alligator lizard

Gerrhonotus coeruleus Wiegmann, 1828:380. See species account.
Gerrhonotus burnettii Gray, 1831:64. Type-locality, "South America," in error, revised to Monterey, Monterey County, California by Fitch (1938). Holotype, adult, British Museum (Natural History) 1946.8.7.94, collected during the voyage of HMS Blossom to the Pacific and Bering's Strait in 1827 (holotype examined by author).
Elgaria formosa Baird and Girard, 1852:175. Type-locality, "California," restricted to Marin County by Fitch (1938). Holotype, U. S. Natl. Mus. 4132 (now apparently lost), collected in 1841 by the U. S. Exploring Expedition under command of Capt. Charles Wilkes.
G[errhonotus]. (Elgaria) formosa: O'Shaughnessy, 1873:47.
Gerrhonotus caeruleus: Bocourt, 1878:353.
Gerrhonotus grandis: Yarrow, 1883:47 (part).
Gerrhonotus multicarinatus: Yarrow, 1883:47 (part).
Gerrhonotus scincicauda: Yarrow, 1883:48 (part).
Gerrhonotus coeruleus coeruleus: Fitch, 1934:6. First use of trinomial.
Elgaria coerulea coerulea: Tihen, 1949:595.

• DIAGNOSIS. A small subspecies (adults usually less than 100 mm. snout-vent length); ground color brown, gray, or bluish, with a mid-dorsal row of dark blotches, the blotches often expanded to form a longitudinal band with dark borders; dark scales on sides often forming irregular bars containing numerous white-tipped scales; dorsal scales usually in 16 full longitudinal rows; dorsal, lateral, and temporal scales heavily keeled; three to four rows of keeled scales on upper arm; interoccipitals two or three; postnasals four to six.

2. *Gerrhonotus coeruleus palmeri* Stejneger Sierra alligator lizard

Gerrhonotus scincicauda palmeri Stejneger, 1893:196. Type-locality, "South Fork Kings River, Calif." Holotype, adult male, U. S. Natl. Mus. 18606, collected by T. S. Palmer in 1891 (holotype examined by author).
Gerrhonotus principis: Van Denburgh, 1897:113 (part).
Gerrhonotus palmeri: Van Denburgh, 1897:113 (part).
Gerrhonotus multicarinatus palmeri: Cope, 1900:525.
Gerrhonotus coeruleus palmeri: Fitch, 1934:6. First use of combination.
Elgaria coerulea palmeri: Tihen, 1949:595.

• DIAGNOSIS. A medium-sized subspecies (maximum snout-vent length about 120 mm.); ground color dull brown or olive; dorsal dark markings indistinct or almost absent; white-tipped scales, if present, scattered; dorsal scales in 16 longitudinal rows; dorsal, lateral, and temporal scales sharply keeled; all upper arm scales strongly keeled; interoccipital single; postnasals four.

3. *Gerrhonotus coeruleus principis* (Baird and Girard) Northern alligator lizard

Elgaria principis Baird and Girard, 1852:175. Type-locality, "Oregon and Puget Sound," restricted to Puget Sound, Washington by Schmidt (1953). Cotypes (3), adults, U. S. Natl. Mus. 3106 and 5134(2), collected in 1841 by the U. S. Exploring Expedition under command of Capt. Charles Wilkes (cotypes examined by author).
Gerrhonotus principis: Cope, 1875:46. First use of combination.
Gerrhonotus grandis: Yarrow, 1883:47 (part).
Gerrhonotus caeruleus: Boulenger, 1885:273 (part).
Gerrhonotus multicarinatus: Cope, 1900:521 (part).
G[errhonotus]. c[oeruleus]. principis: Fitch, 1934:6. First use of trinomial.
Elgaria coerulea principis: Tihen, 1949:595.

• DIAGNOSIS. The smallest subspecies (maximum snout-vent length about 100 mm.); ground color brown or tan; body sometimes unmarked but more frequently blotched with black, mainly on the sides; frequently a lighter mid-dorsal longitudinal band; dorsal scales in 14 longitudinal rows, often with an extra half-scale row on each side; dorsal and lateral scales weakly keeled; temporals smooth; scales on upper arm smooth, or two to three rows weakly keeled; interoccipitals three; postnasals eight.

4. *Gerrhonotus coeruleus shastensis* Fitch Shasta alligator lizard

Gerrhonotus principis: Van Denburgh, 1897:112 (part).
Gerrhonotus burnettii: McLain, 1899:20.
Gerrhonotus coeruleus: Grinnell and Camp, 1917:169 (part).
Gerrhonotus palmeri: Grinnell, Dixon and Linsdale, 1930:146.
Gerrhonotus coeruleus shastensis: Fitch, 1934:6. Type-locality, "South side of Burney Creek, 3,000 feet, two miles southwest of Burney, Shasta County, California." Holotype, adult male, Univ. California Mus. Vert. Zool. 15047, collected by H. S. Fitch on 27 June 1932 (holotype examined by author).
Gerrhonotus coeruleus utahensis Woodbury, 1945:6. Type-locality, "Sink Valley, south of Alton, about twenty miles north of Kanab, Kane County, Utah." Holotype, adult, Univ. Utah Mus. Zool. 1676, collected by Von Parkinson in August, 1933 (holotype examined by author). See REMARKS.
Elgaria utahensis: Tihen, 1949:595.
Elgaria coerulea shastensis: Tihen, 1949:595.

• DIAGNOSIS. The largest subspecies (maximum snout-vent length about 135 mm.); ground color brown, greenish, yellow, or gray; dorsum and sides heavily marked with dark pigment, usually scattered but sometimes arranged in uneven bands; many dark scales with white tips; dorsal scales usually in 16 full longitudinal rows; dorsal and lateral scales moderately keeled; temporals smooth; two or three rows of scales on upper arm keeled; interoccipitals one to three; postnasals eight.

• REMARKS. *Gerrhonotus coeruleus utahensis* was described by Woodbury (1945) from a single specimen of *G. coeruleus shastensis.* The possible history of this record was discussed by Tanner (1959).

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